

Next Generation Engineering Solutions



# Voice Communication & Recording System for UAS Applications OCS-NG4000-RPS



# Overview

OCS-NG4000-RPS is a special variant of our proven voice communication solution, that is specially optimized for UAS Ground Control Station (GCS) applications with cutting edge capabilities such as airborne radio integration with integrated voice and relay capabilities.

The OCS-NG4000 system differs from other classic TDM based VCS products by being a full “end-to-end” IP solution. Being based on open standard Voice Over IP (VOIP) technologies, it allows effective integration of multiple communication assets including HF/VHF/UHF radios (digital or analog), all types of telephone interfaces, SATCOM, GSM, intercom systems and legacy audio distribution systems.

Our Controller Working Position (CWP) architecture allows users to access all of the communication resources from a very user friendly human-machine interface (HMI) to

## Key Facts

- Optimized for RPS applications with very low rack space requirements
- Flexible CWP options (7”, 8”, 9,6” or customer specific)
- Built-in support for our airborne radio gateway (RIG-200R)
- Built-in recording capabilities
- End-to-end IP based architecture
- Comprehensive voice codec support
- Future proof open architecture
- Supports all radios types (analog, digital)
- Ability to remote control of radios
- Supports all telephony interfaces (CB/LB/FXS/FXO/BRI/PRI/IP etc.)
- Flexible vertical and horizontal expansion
- Fully customizable to customer’s specifications
- Supports optional features such as messaging, ambient recording
- Ability to integrate into other systems such as aural warning systems
- Can be used in both military and civilian scenarios
- Military version supports crypto equipment integration
- Ability to relay voice and data over the UASs systems via our airborne radio gateway
- Ability to register operator screens
- Video surveillance/CCTV footage, ambient sounds record feature in Ground Control Stations
- Voice and video records for navigation systems



enable reliable and secure Air-to-Ground (A/G) and Ground-to-Ground (G/G) communication applications.

OCS-NG4000-RPS is designed to serve under 7/24/365 operational scenarios. Different types of availability levels are possible from space saving “non redundant” low footprint versions to “fully redundant” and even “fault tolerant” systems.

Our solution provides full range of features to meet demanding Air Traffic Control (ATC) scenarios to bridge the gap between digital and analog communication.

OCS-NG4000-RPS is fully compliant with EUROCAE ED 137 and upcoming updates.

Our VCS enables a futureproof investment and seamless interoperability between legacy and new generation communication systems. It has been designed to meet and exceed industry standards in ATC operations by having an IP based interoperability concept.

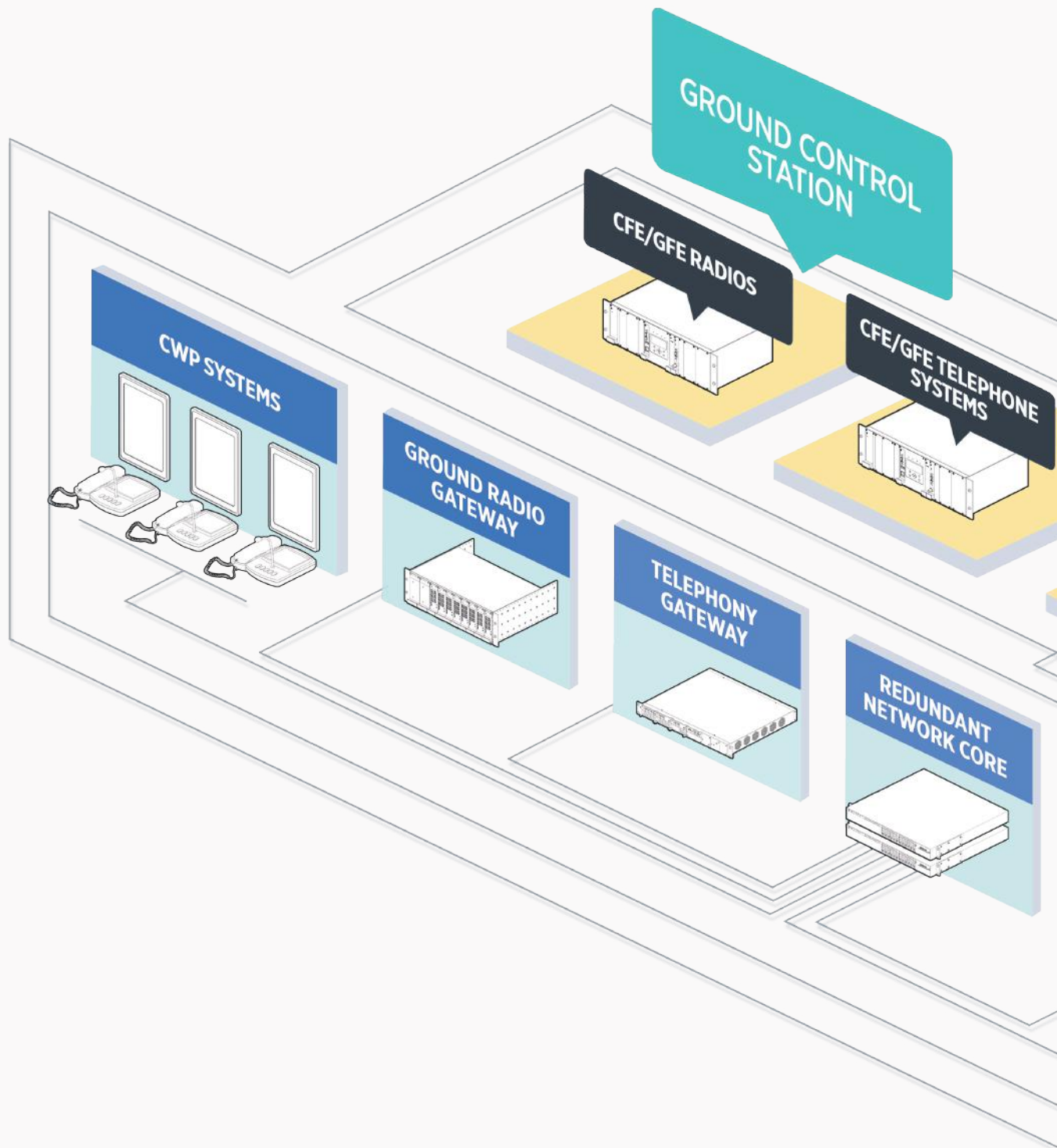
Due to its flexible design, the system can be interfaced with 3rd party systems for a truly integrated Air Traffic Management (ATM) solution.

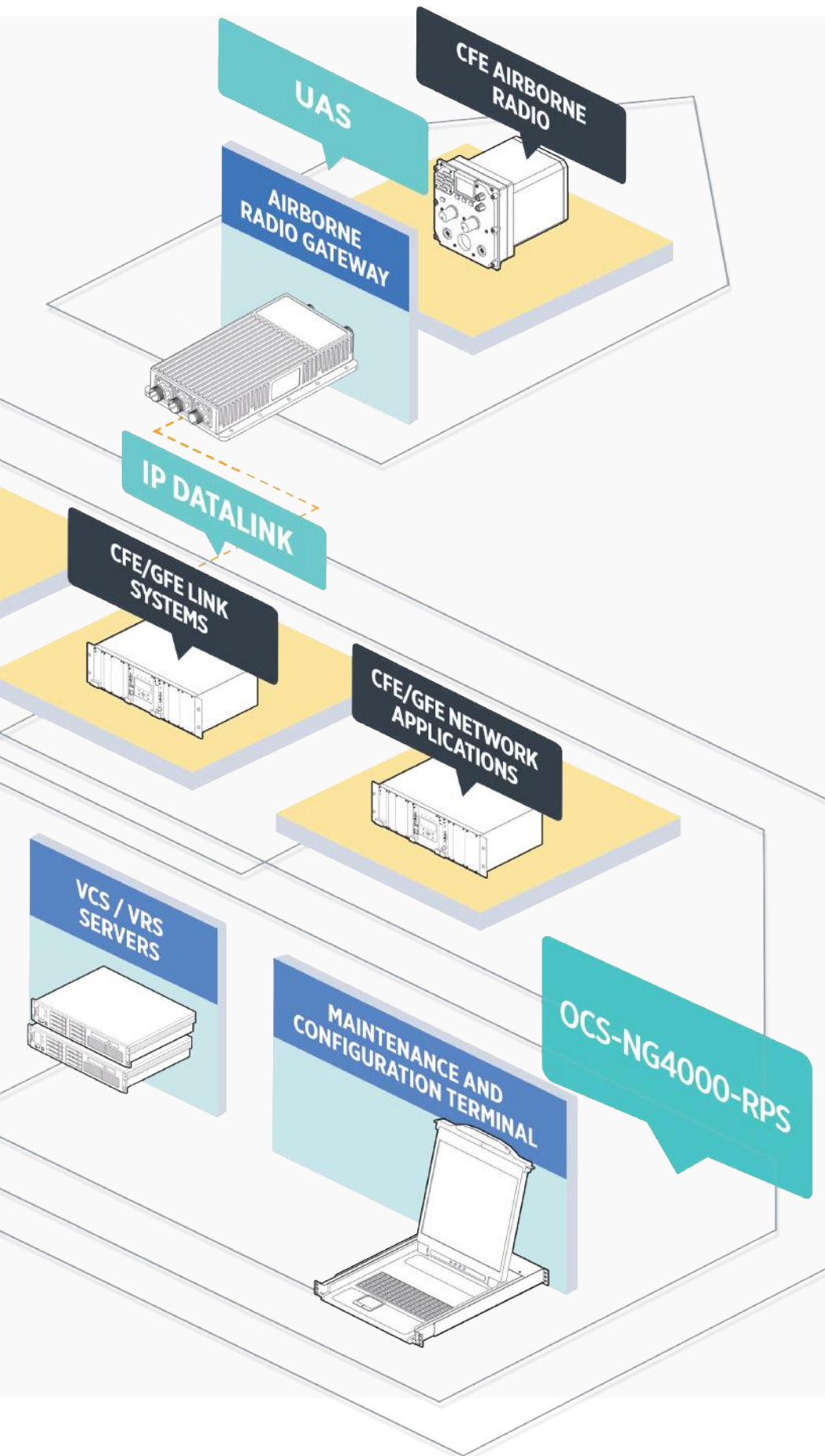
**300.000+  
FLIGHT HOURS**





# System Overview





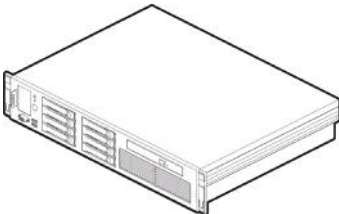
# System Components

## VCS Server

VCS server provides functional features such as component registration, configuration and control, device monitoring, authentication authorization and accounting features on the system level.

Our communication software services are designed to be hardware independent and provides investment protection against hardware technology obsolete.

As the hardware platform, we are able to utilize COTS server platforms, industrial or MIL-SPEC servers to meet any type of environmental conditions and electromagnetic interface (EMI)/electromagnetic compatibility (EMC) compliance. "Stand alone", "redundant" and "fault tolerant" level architectures are possible in our server components.



### Technical Specifications

- Wide selection of CPU modules based on customer specifications
- Hardware level redundancy
- Redundant power supplies
- AC/DC power options
- Redundant network connections
- Integrated server monitoring
- COTS, Industrial or MIL-SPEC versions available

## Controller Working Position (CWP)

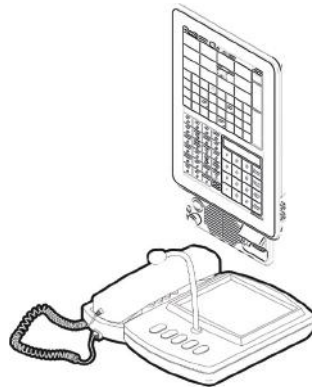
Our CWP solution comprises of a touchscreen with integrated processing capabilities. Screen size of the CWPs are completely flexible. We have successfully implemented CWPs starting from 5" screens up to 17" based on customer's functional requirements.

**The CWP solution enables consolidated access to all communication channels with small but effective details such as:**

- Handsfree or PTT options
- Footswitch capability
- Wireless headsets

**The CWP applications also enable advanced functionalities such as:**

- Text messaging
- Radio remote control
- Radio-telephone coupling
- Radio-radio coupling
- Monitoring of essential services



### Technical Specifications

- Wide selection of CPU modules based on customer specifications
  - Variety of screen sizes
  - Redundant power supply options
  - AC/DC power options
  - Redundant network connections
  - COTS, Industrial or MIL-SPEC versions available
- Variety of audio interface options:
- Loudspeaker
  - Headset
  - Handset
  - Hand mic
  - Noise cancelling options

## Integrated Recording Service

One of the most distinctive features of our VCS solution is integrated recording capability.

Without the necessity for external recorders, our VCS solution, out of the box, supports integrated recording capability for all communications over the CWPs.

**If requested, recording capability can be expanded to include other systems such as:**

- Radar video screens
- Avionic screen recording
- CCTV systems
- Payload video streams
- Recording of datalink messages
- System security and warning events
- Access control systems
- Information coming from external systems for full legal compliance

Same level of redundancy implementations as the VCS servers are inherently possible.

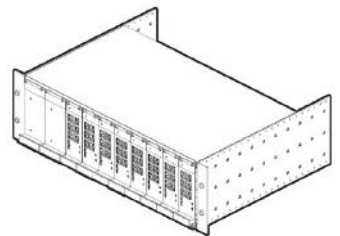
### Technical Specifications

- Works as a software service on VCS servers
- Ability to record voice, video and data
- 3rd party interfaces can be implemented
- Time stamped for legal compliance
- Comprehensive playback application software delivered for replay requirements
- Fully redundant

## Radio Over IP Gateway (RIG-200)

Innovative radio integration capabilities of our solution puts us one step ahead of the competition. Majority of our users wish to be able use their existing radio systems but still be able to benefit from IP based communication solution approach. In order to accommodate such requirements, we have developed our radio gateways with flexibility and reliability in mind.

Each radio gateway module is independently powered for redundancy and features redundant network interfaces for network availability. Since the radio gateways have IP interfaces, access to both local and remote radios are possible over standard network connections. Furthermore, if interface control documents are provided, our gateways are able to remote control the radios for even further versatility. We have successfully implemented radio remote control over network interfaces, serial lines and discrete I/O lines.



### Technical Specifications

- Modular architecture
- Legacy analog and IP radios are supported
- Redundant power supplies
- AC/DC power options
- Redundant network connections
- Integrated device monitoring
- MIL-SPEC version available
- Comprehensive codec support
- Analog, Discrete Serial I/O for deeper integration requirements

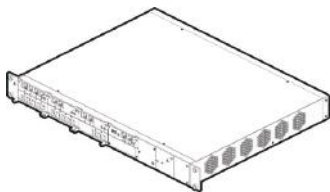
### Telephony Gateway (TGW-NG200)

Our gateways use state-of-the-art technology to bring total communication collaboration capabilities to operators.

We are able to interface with:

- IP trunk or subscriber lines
- E1 PRI interface
- ISDN BRI interface
- FXS/FXO analog interfaces
- 4W E&M telephone lines
- CB/LB type legacy telephone interfaces

In addition to standard telephony functions, advanced functions such as multi-way conferencing, telephone-radio coupling, supervisory monitoring are offered as standard features.



#### Technical Specifications

- 1U low profile and 6U high capacity versions available
- Redundant power supplies
- AC/DC power options
- Redundant network connections
- Integrated device monitoring
- Comprehensive codec support
- Comprehensive telephony interface support (IP, E1, BRI, FXS, FXO, LB, CB, E&M)

### Airborne Radio Gateway (RIG-200R)

UAS platforms provide a very valuable infrastructure for the battlefield. Many platforms are able to carry value added payload such as:

- Day/Night/Thermal camera systems
- IR sensors
- SAR systems
- SIGINT/COMINT payloads
- E/W payloads
- Weapon systems

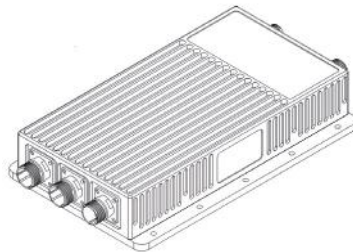
Although some platforms have integrated airborne radios for communication relay support, their functionality is limited to LOS distance between the GCS and UAS itself.

Our revolutionary airborne radio gateway enable access to airborne radios over the UAS datalink. Whether it is a LOS datalink or satellite datalink our solution enables the operators to access to airborne radios as an integrated part of the VCS. Advanced functionality such as telephone-radio coupling enables remote telephone users (such as command level decision makers) to use the radios to communicate directly with remote units.

RIG-200R also enables:

- Remote control of airborne radios
- Radio cross coupling between radios
- Voice relay over radios (even on the same frequency)
- Cross band radio relay (i.e VHF to UHF and vice versa)
- Relay of data devices such as
  - PLS systems
  - Voice crypto equipment

OCS-NG4000-RPS VCS system comes with built-in support for our airborne radio gateways.



#### Technical Specifications

- Same functional specifications as our radio over IP gateway but standalone operation
- Already qualified to MIL-STD-810 and MIL-STD-461 specifications

### Other / Optional

We are able to offer a turnkey solution, where we supply all the components or reuse customer's existing infrastructure if needed.

Examples of such cases are:

- Integrate with customer's network infrastructure
- Use existing NTP servers for accurate time information
- Provide our maintenance and configuration terminal software to run on existing servers or workstations

### Integration With 3rd Party Systems

In addition to standard communication functionality, we are able to interface with 3rd party systems for added convenience.

Such additional capabilities include but not limited to:

- Aural warnings from flight instruments
- Navaids warning sounds
- Signals intelligence (SIGINT)/communications intelligence (COMINT) sensor integration
- PLS(Personnel Location System)
- Voice crypto systems



# Basic Application Examples

## Generic G/G and A/G Communication

Most generic applications of our solution is standard ATC functionality, where operators are able to access to radio and telephone assets for their generic air traffic control needs.

### Operators are able to communicate:

- With airfield ATC units
- Ground support crew
- Neighboring ATC/ACC Center
- Command and Control Centers

## Radio Relay Over UAS

One of the most innovative applications of our airborne radio gateway is the ability to use the UAS itself as a radio relay station.

This capability not only enables the remote units in the field to communicate among themselves, it also allows the operator assisted relay functionality as well.

Bridging the communication gap between geographically separated units can play a game changing role on the battle field.

## Special Operations Communication Support

Special operation communication requirements are more challenging by their nature.

Most of the time, special operation teams have to operate in detached fashions, but UASs can enable effective and real-time communication between different teams, as well as between teams and Command Control Centers.

## Extended Radio Coverage Over Datalink

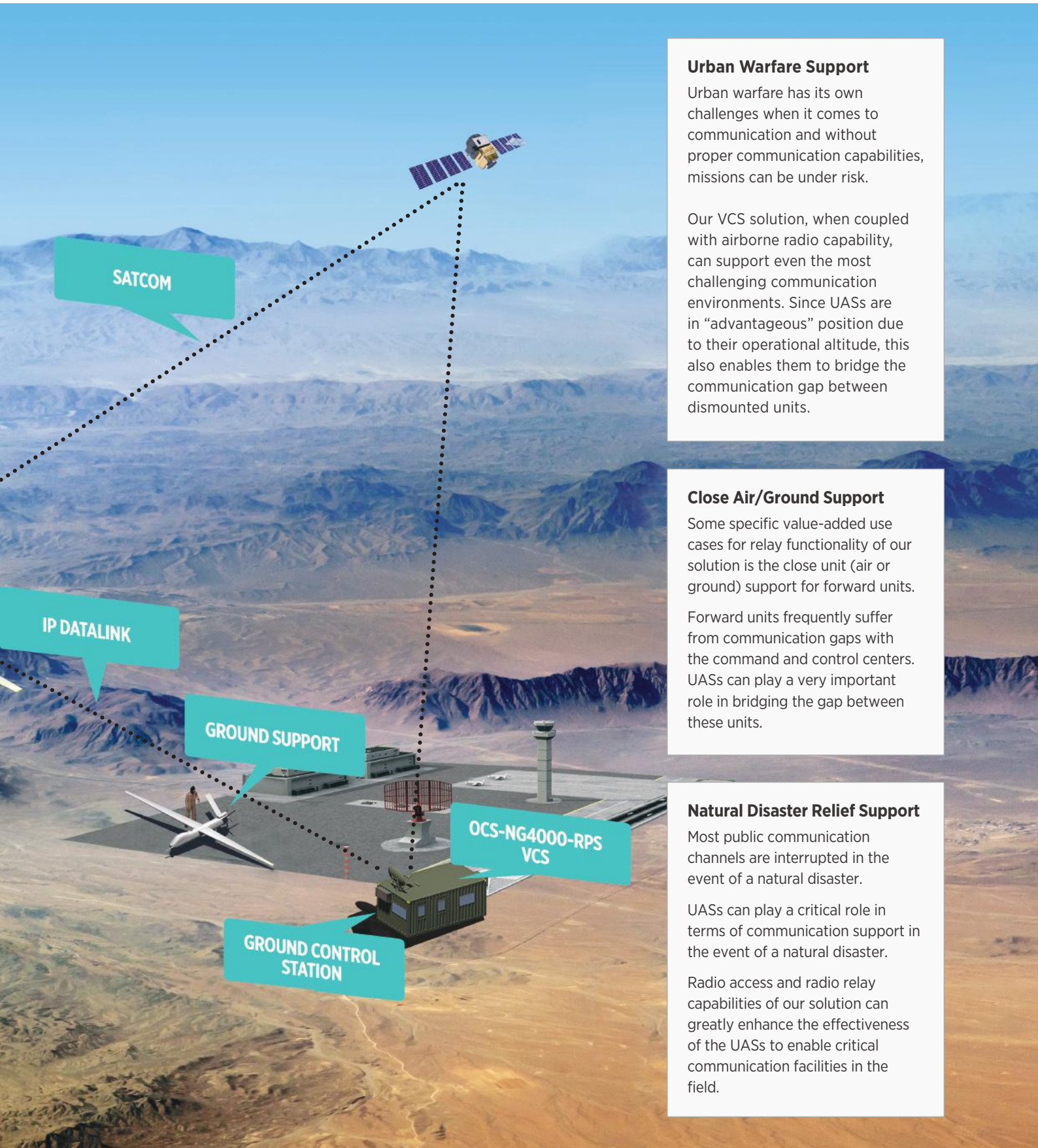
Our airborne radio gateways, when integrated into our VCS solution, enable the operators to use radios on the UAS for extended radio coverage.

The most obvious advantage of our solution is as it removes the physical barriers of radio relay between GCS and UAS and extends radio coverage over the existing IP datalinks.

When SATCOM facilities are used, radio coverage becomes limitless.







### Urban Warfare Support

Urban warfare has its own challenges when it comes to communication and without proper communication capabilities, missions can be under risk.

Our VCS solution, when coupled with airborne radio capability, can support even the most challenging communication environments. Since UASs are in “advantageous” position due to their operational altitude, this also enables them to bridge the communication gap between dismantled units.

### Close Air/Ground Support

Some specific value-added use cases for relay functionality of our solution is the close unit (air or ground) support for forward units.

Forward units frequently suffer from communication gaps with the command and control centers. UASs can play a very important role in bridging the gap between these units.

### Natural Disaster Relief Support

Most public communication channels are interrupted in the event of a natural disaster.

UASs can play a critical role in terms of communication support in the event of a natural disaster.

Radio access and radio relay capabilities of our solution can greatly enhance the effectiveness of the UASs to enable critical communication facilities in the field.

# Advanced Application Examples

## Overview

In order to enable very advanced integration capabilities, we have designed our airborne radio gateway to support not only voice signals, but also data signals. Therefore, in addition to regular voice processing, our gateways support digitization of:

- Analog
- Discrete
- Synchronous and asynchronous serial data

## PLS (Personnel Location System) Over Airborne Radios

Most Air Force units around the world use Personnel Location Systems (PLS) transponders for their pilots for Search and Rescue Operation in the event of a failure.

These transponder units enable interrogation of compatible units in emergency or previously selected frequencies to gather location data, as well as special messaging functions.

Our airborne radio gateways can transparently integrate with PLS systems on the GCS shelters to relay these interrogation and response signals over the airborne UAS radios.

Since PLS equipment is placed in the GCS and not on the UAS, this capability also enables the physical security of these sensitive communication devices.

## Encrypted Voice Radio Access Over Airborne Radios

Traditional voice encryption devices for radios need to be collocated with the radios. However, placing the voice encryption equipment on a UAS is inherently insecure, especially in the event of a crash behind the enemy lines.

Our VCS features suitable interface modules which enable the separation of the radios and the voice encryption devices.

Special interface modules are placed in the GCS and, both PT and CT interfaces are converted to be carried over the IP data link. On the UAS side, our airborne radio gateway can transparently process these signals to ensure the integrity of the communication.

This solution enables end-to-end encrypted communication over the UAS between forward units and command and control centers.

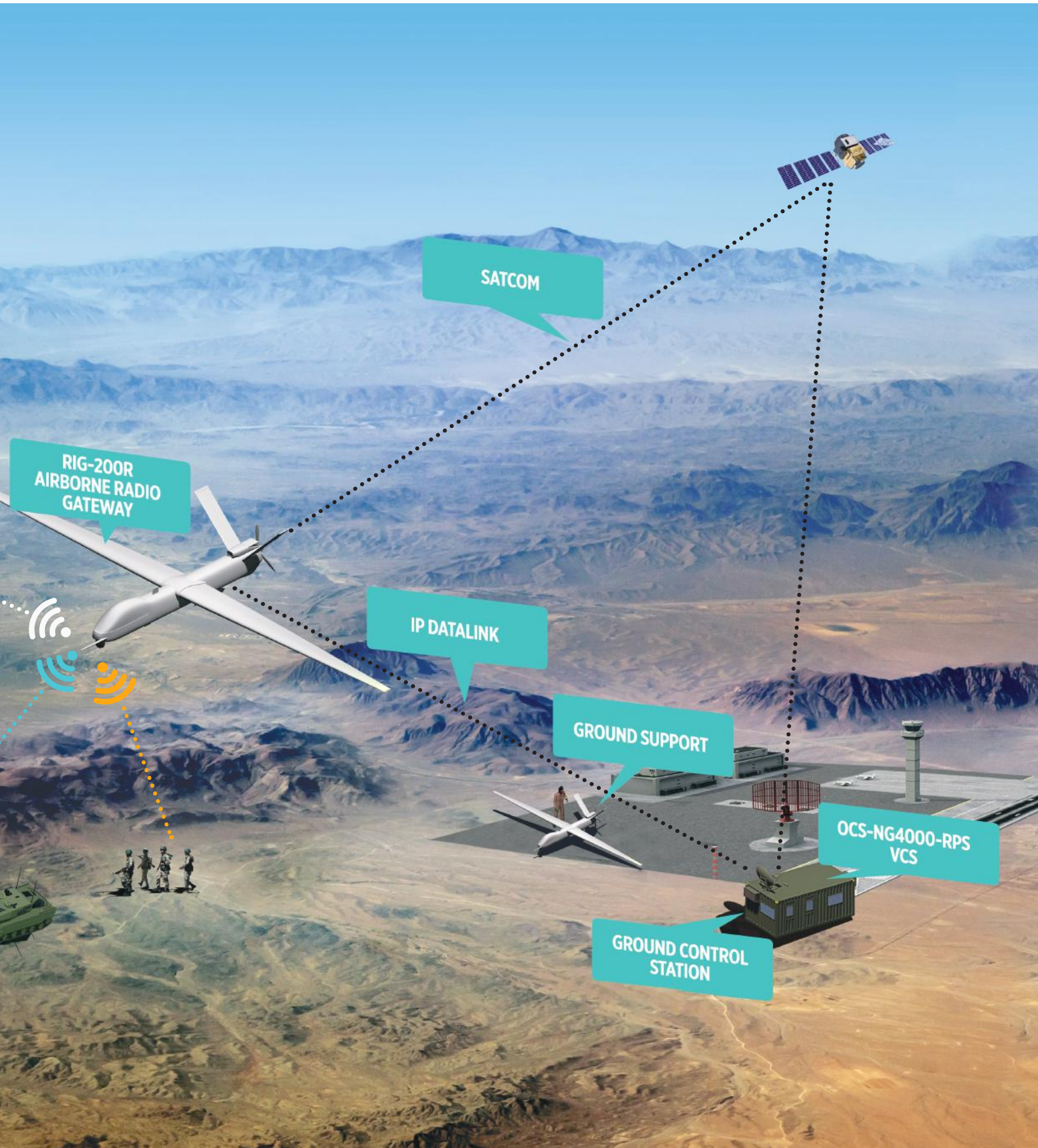
## Access To Airborne Voice Sigint/Elint Sensors Over Datalink

With the evolution of technology advanced UAS platforms have been furnished with SIGINT/COMINT sensors.

Our VCS solutions enable a transparent pathway to the operators to access the voice and data capabilities of these payloads on the GCS side.









# Voice Communication & Recording System for UAS Applications OCS-NG4000-RPS



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